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2019 Pesticide Safety - Floods for Pest Management

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Flooding Options for Pest Management

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Pesticide Safety Meeting

April 25, 2019

Why are we interested

- Cost savings?

- ✓ *Much depends on cost to manage the flood*
- ✓ *Elimination of some pesticide applications*
- ✓ *Biggest potential is with Late Water*
- ✓ *Concern about carbohydrate 'cost' to the cranberry*

- Organic Production

Types of Floods

Late Water

CFW

Fruit rot

Mites

Weeds?

Summer Floods

Grubs

Perennial weeds

Fall Floods

Girdler

CFW

Perennial weeds

Short Spring Floods

Black-headed fireworm

Dodder

Late Water Method

- 30 day re-flood starting about April 15
Weather and plant stage determines this
- Buds must still be dormant
ok if leaves are a bit green
- Flood must cover vines
- Ideal is warm water but less than 65F
- Plants lose carbohydrate but recover within 2 weeks after flood

Late Water - Pros

- Suppresses fruit rot
 - No fungicide needed that year*
 - Reduced rates or no fungicide in following year*
- Suppresses cranberry fruitworm (CFW)
 - Many sites needed no sprays*
- Suppresses cutworms
 - But watch for re-invasion after*

Late Water - Pros

- Suppresses Southern Red Mite
Controlled in LW year and most of next
- Suppresses dewberry
Prevents spread
- Need less fertilizer; 30% less N
- New plantings
- Maybe less frost protection for the season

Late Water - Cons

➤ Loss of frost tolerance

After 2 weeks some; after 3 weeks all

➤ Temperature of the flood

Warm kills pests but can affect cranberry – the carbohydrate hit

Algae growth

➤ Early release less effective

4 weeks killed 98% CFW

2.5-3 weeks killed 40-50% CFW

➤ COST?

Short May Floods

➤ 24 hours

Un-webbed worms (false army, blossom, gypsy moth)

➤ 48 (up to 72 hours)

Webbed worms: BHF, YHF (must have hatched)

Dodder

NOT Spag

➤ Must be able to move water fast, cover vines completely

Spring Flash Flood - When?

- Early to mid May – BEFORE roughneck
- Cloudy, cool – not above 75-80F air T
(less carbohydrate impact)
- But warm water kills pests better
(less oxygen)
- Timing for pest development
BHF: eggs must be hatched but worms small
- Dodder – must be germinated but not
attached to cranberry



Spring flood

Black-headed Fireworm (BHF)



- Timing critical – must be hatched
- Kills most larvae but if not all hatched may still have a problem after
- If water too cool – not effective

Spring floods

Dodder

- May match up with BHF timing
- 24-48 hrs
- Variable impacts
- Suppresses dodder growth NOT seed germination
- Timing critical: 3-4 weeks after first emergence





Attachment to initial host,
produce haustoria

Proliferation of stems,
additional host attachments

May

May-June



Flowering

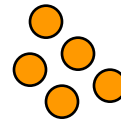
Seeds form

July-August

Seed set and
stem senescence

September

Overwintering seed



* May occur in some species

Elongation and
searching

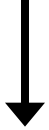
Hook

Late April -
Mid-May

Germination and
emergence



Flooding



Summer Flood

- Mid May to mid July
- Eliminates crop
- Grubs, briars controlled
- Preparation for renovation?

Fall floods



- Cranberry Girdler

September 25th for 1 week

May coincide with harvest for early cultivars

- Holding the harvest flood

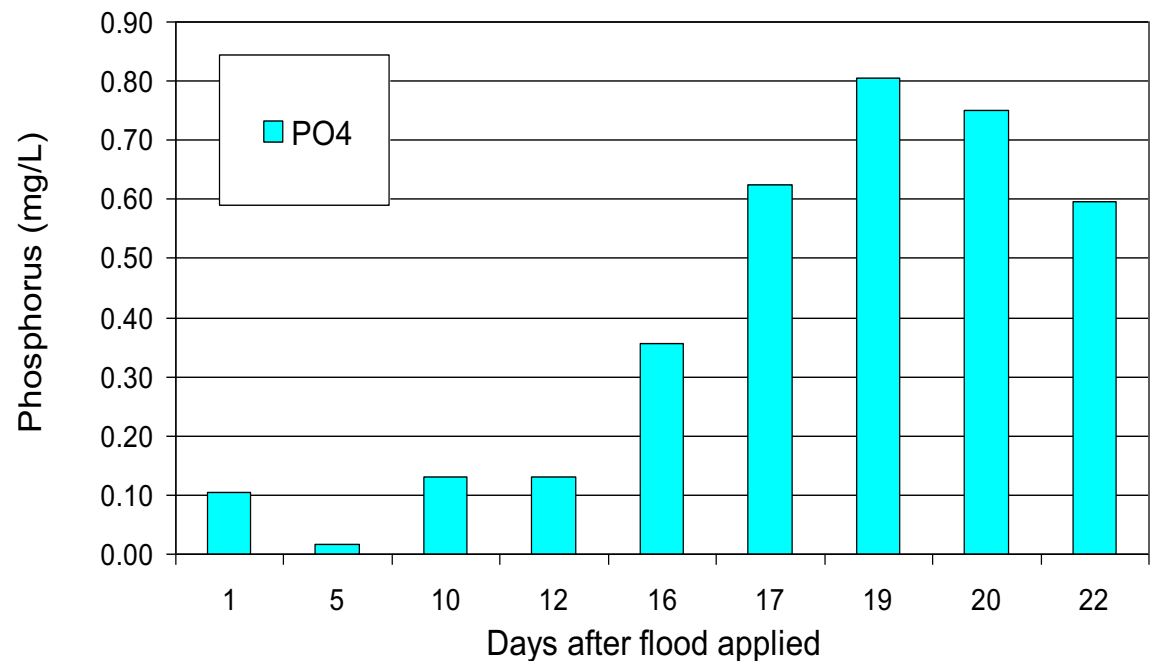
Up to 4 weeks, best if start by late September

Suppresses dewberry and CFW

Fall floods - harvest

Holding the harvest flood

- ✓ Up to 4 weeks, best if start by late September
- ✓ Suppresses dewberry and CFW
- ✓ No apparent impact on yield but carbohydrates take a big hit
- ✓ Water quality?



Fall Flood

Only affects running bramble (not upright)

1/3 fewer crowns after 4-week flood

3-week flood results mixed

Running Bramble (*R. hispidus*)



Upright Bramble (*R. allegheniensis*)



Fall Flood

Killed CFW in hibernacula (did not emerge in spring)

100% mortality after 3 or 4 weeks



The Bottom Line

- ✓ Potential exists to reduce pesticide and fertilizer requirements
- ✓ Cost/benefit and cost comparison
- ✓ Manage to limit crop impact and provide effective pest management
- ✓ How much does the flood cost?

This is not a pest management flood – it has to cover the vines or pests just move out of the water



